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Bruising of Red Cherries

Excessive Bruising May Offset Advantages Gained During the Soak Period

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How and where red cherries are bruised has been one object of our research for several years, for we have found that bruising can be a very important factor in determining the yield and quality of the processed product. Visits to processing plants in Michigan, Wisconsin, New York, and Pennsylvania have given us an opportunity to estimate the amount of bruising cherries sustain during their course through the plants. This was done principally by measuring the distances cherries fall, drop, or tumble on the processing lines. Since the information obtained may prove helpful to the cherry industry, we now are making our findings generally available.

The survey has brought forth some surprising results: within-the-plant bruising may indeed be considerable. In one plant, for instance, cherries were dropped a cumulative total of 35 feet during their course from the delivery truck to the final container. In 16 plants the totals ranged from 12 to 35 feet, the average value being 22.8 feet.

Where Bruising Occurs

Bruising may be divided logically into the three following categories: (1) bruising during the unloading and soaking steps; (2) bruising during conveyance between soak tanks and pitters; and (3) post-pitting bruising. On arrival at the plant, cherries are dumped into soak tanks, after which they are conveyed to sorting belts and pitters by a series of flumes, elevators, size-grates, and belts. Bruising occurs principally as cherries drop from one conveyor to another. In the present study, 69 per cent of the drops were onto hard surfaces, such as hard rubber or metal, rather than into water. The average number of drops was 15.5 and the average distance of drop was 1.5 feet.

The bruising of cherries during unloading and spreading in soak tanks was relatively minor. The chief disadvantage of bruising at this stage is that bruising accentuates the loss of sugars, organic acids, and flavor from the cherries into the soaking water. The scald blemishes that frequently appear on cherries in soak tanks are more closely related to harvest bruising than to soak tank bruising. During the soak period, bruised cherries fortunately regain much of their original firmness. With the increase in water-hauling of cherries, it is likely that the bruising associated with unloading and soaking of fruit will be held at a minimum.

Most Serious Bruising

The bruising that cherries suffer between the soak tanks and pitters is of major significance. In the tanks cherries become relatively firm and otherwise conditioned for satisfactory processing; excessive bruising during their course to the pitters may offset the advantages gained during the soak period. Laboratory experiments have shown, for example, that severe bruising just prior to pitting may lead to tearing of cherries during pitting, clogging of the pitter, faulty removal of pits, prolonged bleeding, poor character of pitted fruit, and low drained weight. Our observations in processing plants generally confirm these findings.

In the 16 plants surveyed, the total distance cherries were dropped between soak tanks and pitters ranged from 5 to 19 feet, the average being 11.2 feet. In some cases the softening of cherries associated with the dropping was considerable, and was shown quantitatively by measurements of their firmness with a pressure tester. The maximum single drop was four feet, onto a hard surface; such a large drop obviously was more damaging to the cherries than was a number of smaller drops.

In most plants, cherries after being pitted were handled carefully and were placed promptly into containers. The average distance cherries were dropped during their travel from the pitter to the final container was four feet. Severe bruising of pitted cherries may result in prolonged bleeding and relatively low drained weight.

Conclusion

Significant variations in the care of handling cherries in processing plants were found. In some plants the bruising of fruit approached a practical minimum; in others, a re-examination of the processing lines seems desirable. It may be feasible and profitable to reduce both the number and severity of the bruises cherries undergo.